

Mikołaj Mieszko Charchuta

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EDUCATION

AMU, POZNAN

MSc in Bioinformatics

Oct 2025 -- Jul 2027

Thesis: *In silico analysis of Cry9 toxins and their genetic determinants in the Bacillus thuringiensis pangenome* (first-author article in preparation).

AMU, POZNAN

BSc in Bioinformatics & Biotechnology

Oct 2021 -- Sep 2025

Thesis: *Comparison of naïve methods for taxonomic classification of microorganisms using marker gene sequences* (created the NaïveR R package).

CHARLES UNIVERSITY, PRAGUE

Erasmus+ Exchange

Winter 2022/23, Summer 2023/24

- Institute of Microbiology, Czech Academy of Sciences: *Profiling metabolism of complex microbial communities with Stable Isotope Probing and meta-omics*.
- Faculty of Natural Sciences, Charles University: Applying CryoEM for studying the structures of cultivated meat proteins.

UNIVERSITY OF GDANSK

National Exchange

Winter semester 2023/24

- Faculty of Biotechnology, UoG & Gdańsk Medical University: Metabolomics & proteomics of SynComs bioprotective against plant pathogens.
- Faculty of Biology, UoG: Genomes of phages infecting uropathogenic *E. coli*.

SKILLS

PROGRAMMING

R • Bash • Python • C++

Git • Docker • AWS • Slurm • Nextflow

BIOINFORMATICS

Transcriptomics (DESeq2, rMATS)

Genomics (samtools, GATK, Hi-C/3C-seq)

Metagenomics (QIIME2, mothur, NaïveR)

THESIS SKILLS

R package development (NaïveR)

Taxonomic classification benchmarking

Pangenome analysis • Cry toxin gene mining

LANGUAGES

English (C2) • Polish (Native) • German (B2)

EXPERIENCE

AMU MICROBIOLOGY DEPT. | Bioinformatician

Sep 2025 -- Present, 20% FTE | Poznań, PL

- Genomics of pests and biopesticidal microbes; predictive protein design.
- Hi-C/3C-seq analysis and workflow development.

BENE MEAT TECHNOLOGIES | Bioinformatician

Mar 2024 -- Jul 2024 | Prague, CZ

- Transcriptomics and nanopore sequencing support.
- Bioreactor automation and production bioinformatics support.

LEIDEN UNIVERSITY MEDICAL CENTER | Intern, Endocrinology Dept.

Jun 2023 -- Oct 2023 | Leiden, NL

- Bioinformatics support, data visualization, and pipeline creation.
- Co-authored publication in AJP (murine model work).

MNM DIAGNOSTICS | Genome Analyst

Feb 2022 -- Jul 2022 | Poznań, PL

- Automation, WGBS (epigenomics) ML feature extraction, data-lake.
- Genome analysis interpretation. Cooperation with clinicians.

PROJECTS

TESTING DYNAMAP™ -- OPTICAL MAPPING & NANOPORE |

Bachelor Thesis Project (Team Lead)

Oct 2023 -- Oct 2025

- Student research grant; led team benchmarking microbiome profiling methods.
- Coordinated with Perseus Biomics - a startup specializing in rapid diagnostics - to test their DynaMAP™ technology for microbiome profiling, comparing it against established methods like 16S rRNA sequencing and shotgun metagenomics.

SPUN -- ILLUMINA SEQUENCING | International Grant

Nov 2022 -- Apr 2024

- Predicted global biodiversity hotspots with ML.
- Field research video: https://youtu.be/6frg_7ykXvc?t=128.

PUBLICATIONS

In silico analysis of Cry9 toxins and their genetic determinants in the Bacillus thuringiensis pangenome
In preparation (expected 2026). Charchuta, M. M. (first), Baranek, J. (second), et al.

Combination of dietary fiber and exercise training improves fat loss in mice but does not ameliorate MASLD more than exercise alone
American Journal of Physiology-Gastrointestinal and Liver Physiology, 2025. Kovynev, A.; Charchuta, M. M.; et al.

WED-517 Oatmeal a day does not keep the doctor away: inulin and exercise impact on MASLD amelioration and gut-liver crosstalk
Journal of Hepatology, 2024. Kovynev, A.; Charchuta, M.; et al.